

NMRC Researchers Seek Ways to Improve the Safety, Comfort and Survivability of the Warfighter

Naval Medical Research Center

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Date: 08.22.2018

Posted: 08.23.2018 12:42

News ID: 289986

Researchers from Naval Medical Research Center (NMRC) presented their work: Enhancing Human Performance & Survivability in Extreme Environments during a breakout session at the Military Health System Research Symposium Aug. 21.

A team of scientists led by Dr. Aaron Hall, research physiologist, Undersea Medicine Department, discussed their work to improve the safety, comfort and survivability of the warfighter.



According to Hall, the goal of the discussion was to bring a diverse group of people together working on various, varied disparate extreme environment challenges and dealing with very different kinds of physiology and put them all in one room, then show how there are common overlapping ideas and research which can be used to develop new collaborations and new ways to approach research this type of research.

“We interact by interacting with our human partners. They are right next to the warfighter and so we get information fed into us about their requirements, and their needs,” Hall said. “We are challenged with operators working up in space, high altitude, and diving - from special ops to shallow water, using different breathing mixtures, or very deep diving, and so the idea is each one of these scenarios has particular physiological risks associated with operating and surviving in those environments.”

Lt. Geoffrey Ciarlone, research physiologist, spoke about developing a program with the undersea medicine department to mitigate hypoxia or high altitude dependent decreases in cardio vascular performance of muscular-skeletal strength.

Guest researcher, Lt. Cmdr. William Cronin, an undersea medical officer, explained ways to improve pulmonary function outcomes in research models after hyperbaric oxygen exposure.

Undersea Medical Officer Lt. Rainey Johnson, ended the discussion with an in depth explanation comparing different treatment tables for the treatment of research models with neurologic decompression sickness by using different treatment gasses.

“Something that makes us different from other labs is how we focus on operational scenarios,” said Cmdr. Hugh Dainer, department head, Undersea Medicine. “We try our best to help people survive in difficult situations or perform in other extreme environments.”

Included in the team, but who didn’t speak were Cmdr. Josh Swift, research physiologist, collaborating with partner agencies to maximize altitude projects and Dr. Brian Williams, a post-doctoral fellow. Williams recently received a grant to study how to look at ways to delay or abolish seizures that occur following extended oxygen exposure at depth and appreciates the valuable experience he’s gained since joining the lab.

“I’ve had the opportunity to work with scientists and physicians on everything from critical care to metabolic pathways. I’ve been shown a wide variety of research, hyperbaric and hypobaric,” he said. “The lab is doing a lot of great work to answer operational relevant questions in an expedient manner.”

MHSRS is the Department of Defense's (DoD) premier scientific meeting; a unique collaborative opportunity for military medical care providers, DoD scientists, academia and industry to exchange information on research advancements and health care developments in the areas of combat casualty care, military operational medicine, clinical and rehabilitative medicine and military infectious disease research program.

NMRC's eight laboratories are engaged in a broad spectrum of activity from basic science in the laboratory to field studies at sites in austere and remote areas of the world to operational environments. In support of the Navy, Marine Corps, and joint U.S. warfighters, researchers study infectious diseases; biological warfare detection and defense; combat casualty care; environmental health concerns; aerospace and undersea medicine; medical modeling, simulation and operational mission support; and epidemiology and behavioral sciences.

NMRC and the laboratories deliver high-value, high-impact research products to support and protect today's deployed warfighters. At the same time researchers are focused on the readiness and well-being of future forces.

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